Frequently Asked Questions Regarding the Fennville/Birds Eye Foods, Inc. Groundwater Situation

How Birds Eye was identified as having a groundwater problem.

In Michigan, many food processing facilities, including Birds Eye Foods, Inc. (Birds Eye) dispose of their wastewater by discharging to groundwater. The discharge of wastewater from these facilities is regulated under Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). Under Part 31, a discharger must obtain a permit from the Department of Environmental Quality (DEQ), Water Bureau (WB) for these discharges.

The most common disposal system consists of discharge by means of land application using spray irrigation. Some facilities provide storage lagoons and stabilization prior to discharge through lagoon seepage or spray irrigation, others spray irrigate effluent without providing any pretreatment. In the past, it was thought that such systems were a viable means of wastewater disposal for the food processing industry. However, in the last several years, groundwater monitoring results have shown that these systems may negatively impact groundwater due to the characteristics of the wastewater.

Prior to 2000, permits for food processors generally did not require groundwater monitoring for metals such as iron, manganese and arsenic, because these substances are not typically present in the effluent wastewater. More recently, the DEQ began requesting that food processors monitor groundwater for metals. As new data became available, the DEQ discovered that groundwater hydraulically downgradient of these discharges often contained high levels of iron, manganese and arsenic. Even after identifying the problem in groundwater, it took some time to establish the cause and effect relationship. The problem results from the fact that wastewater from food processing has a very high organic content. The biological activity, also known as Biochemical Oxygen Demand (BOD), associated with disposal of the untreated or minimally treated wastewater with this high organic content releasing the naturally occurring iron, manganese and arsenic that had been adsorbed onto soil particles to a form that is soluble in groundwater. The concentrations of iron and manganese leached into groundwater as a result of this process often exceed the aesthetic and health based standards for those parameters established under the state's environmental clean up statute (Part 201, Environmental Remediation, of the NREPA). The recent change in the federal Maximum Contaminant Level (MCL) for arsenic from .050 milligrams per liter (mg/L) to .010 mg/L has caused arsenic to be added to the list of parameters of concern for these discharges. The .010 mg/l MCL for arsenic is also the generic residential clean up criteria under Part 201.

Drinking Water Concerns

Many residents with impacted water supplies may have questions regarding the health effects from elevated levels of iron, manganese, and arsenic. The following is a brief explanation of the occurrence and health effects from these groundwater constituents.

ARSENIC

Earth materials such as bedrock, sand and gravel may contain arsenic bearing minerals. Arsenic may be dissolved by, and absorbed into, the drinking water we withdraw from the ground. Arsenic has no smell or taste in water so you cannot sense if arsenic is present. The best way to determine if your well water has been impacted is to have it tested for arsenic.
The way arsenic affects our bodies is not fully understood. Studies of exposed populations in the United States have not shown clear proof of health problems caused by drinking contaminated water at levels similar to those found in Michigan well water.
Exposure to levels of arsenic in drinking water above the health standard (MCL is 0.010 mg/L) over many years could result in health effects such as:

- Thickening and discoloration of the skin. Sometimes these changes can lead to skin cancers. These cancers can be cured if discovered early.
- Stomach pain, nausea, vomiting and diarrhea.
- Numbness in the hands and feet.

IRON

Iron is a necessary nutrient. Although iron occurs naturally in ground water, it is rarely found at concentrations greater that 10 mg/L. Water with high iron levels can form reddish brown particles that settle on the bottom of a glass of water. When iron combines with tea, coffee and other beverages, it can produce an inky, black appearance and a harsh, unacceptable taste. Vegetables cooked in water containing excessive iron turn dark and look unappealing. Concentrations as low as 0.300 mg/L can leave reddish brown attains on plumbing fixtures, tableware and laundry that can be hard to remove. When these deposits break loose from water piping, rusty water will flow through the faucet. Excess iron may cause the growth of iron bacteria. Iron bacteria leave a reddish brown or yellow slime that can clog plumbing and cause an offensive odor.

Symptoms of excessive iron intake are generally seen only in individuals who have a genetic disorder (e.g. hereditary hemochromatosis); those persons should consult with their physician or other health care provider. Because of aesthetic impacts from iron, the Secondary Maximum Contaminant Level (SMCL) is 0.300 mg/L. The SMCL is also the generic residential clean up criteria established under Part 201. The health-based Drinking Water Criteria (DWC) is 2.0 mg/L.

MANGANESE

Manganese is an essential nutrient, and eating a small amount of it each day is important to stay healthy. Manganese is contained in groundwater and soil at low levels. Low to moderate levels of manganese can cause drinking water to exhibit discoloration and an undesirable taste. Exposure to excess levels of manganese may occur from breathing air, particularly where manganese is used in manufacturing, and from drinking water and eating food. At high levels, it can cause damage to the nervous system that results in behavioral changes and other nervous system effects. The aesthetic criterion, or Part 201 generic

residential clean up criteria is 0.050 mg/L and the health based Drinking Water Criteria (DWC) is 0.860 mg/L.

Any interested party with additional questions regarding the health effects of these substances may contact Ms. Amy Perbeck, DEQ, WB, Surface Water Assessment Section, Water Toxics Unit at 517-373-1046, or call the Michigan Department of Community Health Hotline at 1-800-MI-TOXICS (1-800-648-6942).

For more information, you can access the following links:

http://www.epa.gov/safewater/arsenic/pdfs/fs_arsenic_justthefactsforconsumers.pdf

http://www.deq.state.mi.us/documents/deq-ead-tas-arsenicbroch.pdf

http://www.atsdr.cdc.gov/tfacts151.pdf

http://www.myfloridaeh.com/programs/chemical_fact_sheets/Iron_FS.pdf

DEQ response to the problem

The DEQ first became aware of this problem at Birds Eye in 2004 when groundwater monitoring data identified groundwater contamination near the Birds Eye spray irrigation fields. At that time, the DEQ requested that Birds Eye begin a remedial investigation in accordance with Part 201 of the NREPA. A work plan for a remedial investigation was approved by the DEQ on January 20, 2006, Birds Eye began implementing the remedial investigation in 2005 and completed a majority of the work by 2008. The investigation of the groundwater contamination is continuing. To date the investigation has included private water supply sampling and on-going efforts to determine the extent of the groundwater contamination. Birds Eye is currently preparing a final Remedial Investigation Report which will ultimately provide the basis for future response activities to address the groundwater contamination in accordance with Part 201 of the NREPA.

In response to data collected to date, Birds Eye has implemented an interim response providing bottled water to several area residences. Of particular concern to the WB are those water supply wells with currently identified with levels of arsenic, iron or manganese in excess of the health based criteria. All residences with levels of these substances above the health based criteria are currently being supplied with bottled water.

The DEQ is continuing to actively pursuing a remedy with Birds Eye. Birds Eye has proposed a schedule to complete upgrades to its wastewater treatment system to effectively treat BOD concentrations in its wastewater. The DEQ is also working with Birds Eye to develop acceptable response activities to address the groundwater contamination. These activities will include continued interim response activities to address water supply contamination, and a final remedy to appropriately address the groundwater contamination in accordance with Part 201 of the NREPA.

It is the DEQ's intent to negotiate a legally binding agreement with Birds Eye to address these issues. The agreement will include a schedule for completion of the wastewater treatment system upgrades and the implementation of necessary response activities in

accordance with Part 201 of the NREPA. The DEQ will provide further updates to interested parties on the progress of its discussions with Birds Eye at appropriate intervals, and will make a copy of any such agreement with Birds Eye available for public review.

Any interested party with questions regarding the on-going response activities at Birds Eye may contact the following DEQ staff:

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